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M-8040.1
Appendix 4

wkst TMF Strut Stud.doc
K. Curtis 02/24/04

Aircraft Certification Service
AD PROPOSAL WORKSHEET

DOCKET NUMBER: 04-NE-14

TECH WRITER:

PROPOSED ACTION:

_____ Telegraphic AD
_____ Priority Letter FAA-2004-19463-2
_____ Immediately Adopted AD
_____ Federal Register version of Telegraphic AD or Priority Letter
_____ Final Rule after NPRM *(*See Note on next page)*
__X__ Notice of Proposed Rulemaking
_____ Other ____

Is this proposed action one of the following? *(Check if applicable)*:

_____ *Supercedure of an AD*____ *Revision of an AD*_____ *Supplemental NPRM*

1. Product Manufacturer.

General Electric Company

2. Applies to (models, serial numbers or references, installations, part numbers, as applicable).

General Electric Company CF6-50/-45 series turbofan engines, installed on Boeing DC10 and 747 series airplanes, and Airbus Industrie A300 series airplanes.

3. ACO project engineer.

Name/Title/Branch: Karen Curtis, Aerospace Engineer, ANE-141

Telephone: 781-238-7192

Fax: 781 238-7199

4. Directorate Project Officer (if applicable) and title.

Name/Title/Branch: Karen Grant, Aerospace Engineer, ANE-110

Telephone: 781 238-7119

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5. If this action is a Final Rule after NPRM, list the docket number and the number of public comments received. Fill out the "AD Proposal Worksheet Attachment: Disposition of Comments."

Docket No.:

Number of comments received:

*NOTE: *For Final Rules after NPRM, if any of the following requested information (in **Questions 6 through 23) is unchanged from the NPRM, you may so indicate this in the space provided, rather than repeat the information.)***

6a. Describe the **unsafe condition**.

Prior service experience and analysis has shown that continued operation with one or more separated strut studs can result in low pressure turbine (LPT) flowpath damage, separation of adjacent strut studs, and/or separation of the bolts connecting the LPT stage 1 and stage 2 disks. Continued operation with separated LPT bolts can lead to liberation of the stage 1 disk, disk overspeed, and an uncontained engine failure.

6b. Describe the **cause** of the unsafe condition.

The manufacturer has found that there may be insufficient clearance between the LPT stage 1 nozzle support and the sleeve fitted to the turbine mid frame (TMF). During engine operation, thermal growth differentials can cause bending and reduced low cycle fatigue (LCF) life of the strut stud that joins the nozzle support to the TMF through the sleeve assembly. The manufacturer has also found that re-use of the strut studs at LPT re-assembly can increase the probability of a strut stud separation.

6c. Describe the occurrences that **prompted** this proposed AD action.

This AD is prompted by a shop finding in November 2001. During engine disassembly, one TMF strut stud was found separated in the (LPT) stage 1 nozzle cavity along with one of the LPT Stage 1 to Stage 2 disk joint bolts.

6d. How many such occurrences have been reported?

There has been one documented case of a strut stud failure on a first run engine. Previous failures were attributed to re-used studs. There were 3 uncontained engine failures in 1984/85, prior to GE's release of SB 72-897 in March 1987 that introduced an inspection and an improved strut stud configuration. There were also nine findings of TMF strut stud failure on engines removed for other causes, 10 unscheduled engine removals (UER's) for evidence of strut stud failure, and 20 routine shop findings of strut stud failures. Since the release of SB 72-897, there was one uncontained engine failure in 1996, two findings on engines removed for other causes, and four UER's,

6e. On what date did the FAA become aware of the situation?

November 2001

7. Was this proposed action prompted by a manufacturer's quality control (QC) problem? If so, is a reporting requirement needed in the AD to determine the scope of the problem? *(If yes to either of these questions, coordinate with cognizant MIDO.)*

No.

8. Was this proposed action prompted by the use of suspected unapproved parts (SUP)?

No.

9. Is this action related to an NTSB safety recommendation? If yes, attach a copy of that recommendation and the FAA response.

No.

10. If this proposed action will revise, supersede, or withdraw an existing AD, please provide the following information about the existing AD.

Amendment No.:

Docket No.:

Federal Register Citation:

11a. What are the proposed types of corrective actions (i.e., one-time inspections, recurring inspections, terminating actions, modifications, operational restrictions, etc.) ***AND***

What are the corresponding compliance times?

*(See attached **"SAMPLE: ProposeError! Bookmark not defined.d Corrective Action"** for an example of how this information should be provided.)*

§ Have you considered all of the aspects of what you are proposing, such as overlapping requirements, the effect these actions will have on other existing requirements, and other sensitive issues? *(Be as specific as possible.)*

[Note to Word users: The area below is formatted as a "Table." It allows you to insert as much information as needed into each cell. To move to the next cell, use the Tab key.]

PROPOSED CORRECTIVE ACTION

SERVICE INFORMATION (Attach 2 copies)	ACTION	INITIAL COMPLIANCE THRESHOLD	REPETITIVE INTERVAL (if any)	TERMINATING ACTION (if any)
CF6-50 S/B 72-A1251, dated Sept. 24, 2003	Borescope inspection of LPT stage 1 blades	Prior to exceeding 3000 cycles since new (CSN) or 3000 cycles since TMF strut stud replacement (CSR) or within 150 cycles after the effective date of the AD, which ever occurs later	Every 500 cycles since last inspection (CSLI) or 500 cycles since the last shop visit (CSLSV) or within 150 cycles after the effective date of the AD, which ever occurs later	Engines that have complied with CF6-50 S/B 72-1239, Revision 01, dated September 24, 2003 ("Replace Strut Studs and Increase Clearance of Stage 1 LPT Nozzle Supports) are exempt from the initial and repetitive inspection requirements.

11b. How was the compliance time(s) established?

Updated analysis and field experience.

11c. Has the manufacturer issued relevant service information? If so, attach 2 copies. *(Copies must be legible and of very good quality. Originals are preferred.)*

Yes, SB 72-A1251, dated Sept. 24, 2003 and SB 72-1239, Rev. 01, dated Sept. 24, 2003

11d. If this action relates to a non-U.S. product, has the foreign civil airworthiness authority (FCAA) issued a parallel AD ? If yes, please provide the following information:

FCAA AD Number:

Date of issuance:

11e. Are there any differences between the manufacturer's service information referenced above, other AD's (foreign or U.S.), and the requirements of this AD? (For example, does the compliance time of this AD action differ significantly from that recommended in the referenced service information?) If so, explain these differences and the reasons for each.

Yes. The manufacturer's SB did not provision for engines that may have already accumulated more than 3000 CSN or 500 CSLI without performing the required initial or repetitive inspections. The AD will allow for up to 150 cycles after the effective date of the AD for compliance.

11f. Are notes, drawings, or diagrams needed in the AD to explain procedures or differences from the service instructions? *(If so, please explain below or attach a copy.)*

No

12. Number of aircraft/products that will be affected? *(Use numerical figures).*

There are approximately 2079 CF6-50 engines in service worldwide. US registered operators operate approximately 790 engines. Of those, 784 engines are believed to have accumulated more than 3000 cycles since new.

13. Provide the number of work hours/associated costs per aircraft/product for ***EACH*** proposed corrective action (i.e., inspection, modification, etc.) in the table below.

FOR THE **PROPOSED** AD.

Type of Corrective Action	Number of Workhours per Engine	Number of U.S. engines Affected	Parts Costs per Aircraft
Borescope inspection of LPT stage 1 blades for evidence of damage	1	784	N/A

FOR THE **EXISTING** AD (i.e., the one to be superseded or revised), **if applicable.**

Type of Corrective Action	Number of Workhours per Engine	Number of U.S. Aircraft Affected	Parts Costs per Aircraft

14. If parts are **required**, are they available for all aircraft?

N/A

15. If known, please indicate the number of affected engines that are already in compliance with the proposed inspection, modification, installation, or replacement, etc.

Unknown

16. Should a special flight permit be:

__X__ Permitted

_____ Permitted with limitations ***(List the limitations on a separate sheet.)***

_____ Prohibited

17. In general, how is the product utilized (i.e., air carrier, general aviation, commuter, military, agri-business, training, etc.)?

Commercial air carriers

18a. If this proposed AD would revise or supersede an existing AD, have alternative methods of compliance (AMOC) been approved for the existing AD?

N/A

18b. If yes, should those AMOC's continue to be considered approved for all or any portion of the proposed AD?

N/A

18c. If yes, state for what portions of the proposed AD the previously approved AMOC's should continue to be considered approved.

N/A.

19. With whom outside the FAA has this proposal been discussed (i.e., ATA, NBAA, RAA, AOPA, ALPA, GAMA, etc.)? *(A separate record may need to be submitted to the Rules Docket. See paragraph 3, "Ex parte Contacts," of the AD Manual.)*

NOTE: This item should be completed prior to submission of the AD Proposal Worksheet.

Organization	Person Contacted	Date	Reaction
GE	Dave Shoemaker, DER	June 2003	Supportive

GE	Mike Philips	Jan., Feb. 2004	Supportive

20. Are there any special considerations or concerns that need to be taken into account in the drafting of this proposal? *(Use a separate sheet to detail these items, if necessary.)*

No

21. Do you have reason to believe that this action would be considered "sensitive?" *(See Section 15 of the AD Manual for a definition of "sensitive".)* If yes, please explain below.

No.

22. Please indicate **Yes** or **No** to the following questions:

__No__ Is this considered interim action?

__No__ Do you know of any optional or alternative methods of accomplishing the proposed action?

__No__ Have you considered any alternatives to an AD action?

__No__ Are other Directorates involved in any similar actions?

__No__ Does this action affect the Presidential fleet?

__No__ Does this action affect the FAA fleet?

__No__ Have the proposed procedures been verified (i.e., by MIDO, AEG, ACDO, FSDO)?

23. Check the category that best describes **the cause of the unsafe condition** addressed by this AD:

__X__ Design Problem____ Quality Control Problem

____ Operational__X__ Maintenance____ Unapproved Parts

____ Other (specify):